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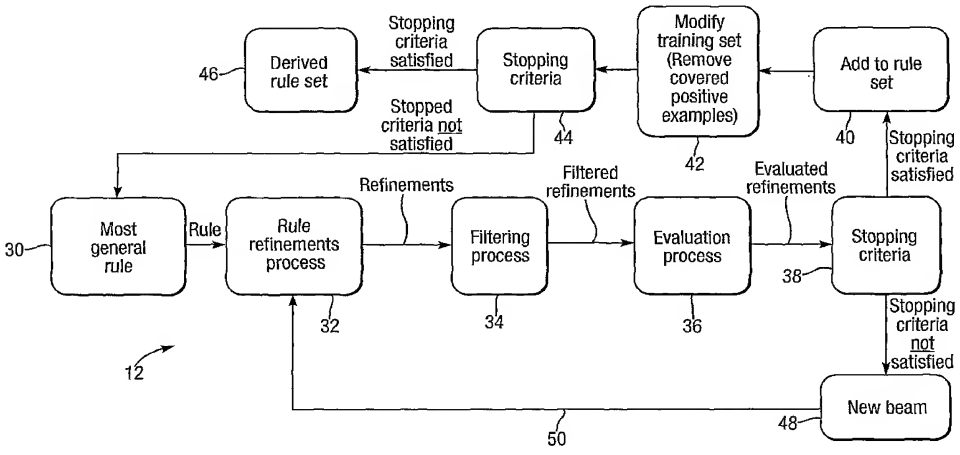
(54) Title: AUTOMATED ANOMALY DETECTION



(57) Abstract: A method of anomaly detection applicable to telecommunications or retail fraud or software vulnerabilities uses inductive logic programming to develop anomaly characterisation rules from relevant background knowledge and a training data set, which includes positive anomaly samples of data covered by rules. Data samples include 1 or 0 indicating association or otherwise with anomalies. An anomaly is detected by a rule having condition set which the anomaly fu,lfils. Rules are developed by addition of conditions and unification of variables, and are filtered to remove duplicates, equivalents, symmetric rules and unnecessary conditions. Overfitting of noisy data is avoided by an encoding cost criterion. Termination of rule construction involves criteria of rule length, absence of negative examples, rule significance and accuracy, and absence of recent refinement. Iteration of rule construction involves selecting rules with unterminated construction, selecting rule refinements associated with high accuracies, and iterating a rule refinement, filtering and evaluation procedure (32 to 38) to identify any refined rule usable to test data. Rule development may use first order logic or Higher Order logic.

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